

Amendment to the Claims:

The following listing of claims replaces all previous versions and listings of claims:

1. (Currently Amended) A method of horizontally structured CAD/CAM manufacturing for alternate operations, comprising:

selecting a blank for machining into an actual part;

establishing a coordinate system;

creating a master process model comprising:

~~a virtual blank corresponding to said blank;~~

~~a manufacturing feature;~~

~~_____ virtual machining of said a manufacturing feature into a said virtual blank corresponding to said blank;~~

~~said manufacturing feature exhibiting an associative relationship with said coordinate system;~~

~~generating a first set of machining instructions to create said actual part by machining said manufacturing feature into said blank;~~

~~generating an alternate master process model comprising:~~

~~_____ an extracted 3-D model from said master process model;~~

~~_____ a manufacturing feature for alternate operations;~~

~~_____ virtual machining of said a manufacturing feature for alternate operations into a said extracted 3-D model, the extracted 3-D extracted from the master process model;~~

~~_____ said manufacturing feature for alternate operations exhibiting another associative relationship with said coordinate system; wherein~~

~~said generating a said alternate master process model following said virtual machining of said master process model; and~~

~~generating a second set of machining instructions to create said actual part by machining said manufacturing feature for alternate operations into said blank.~~

2. (Currently Amended) The method of Claim 1 wherein said associative relationship between the manufacturing feature and the coordinate system is a parent/child relationship.

3. (Original) The method of Claim 1 further including another manufacturing feature exhibiting an associative relationship with said manufacturing feature.

4. (Currently Amended) The method of Claim 3 wherein said associative relationship between the other manufacturing feature and the manufacturing feature is a parent/child relationship.

5. (Currently Amended) The method of Claim ~~3~~4 wherein said virtual blank exhibits an associative relationship with the ~~another said~~ manufacturing feature.

6. (Currently Amended) The method of Claim 5 wherein said associative relationship between the virtual blank and the other manufacturing feature is a parent/child relationship.

7. (Original) The method of Claim 1 wherein said virtual blank exhibits an associative relationship with said coordinate system.

8. (Currently Amended) The method of Claim 7 wherein said associative relationship between the virtual blank and the coordinate system is a parent/child relationship.

9. (Original) The method of Claim 1 further comprising creating extracts from said master process model.

10. (Currently Amended) The method of Claim 9 wherein said extracts comprise replicated models of said master process model at various operations of ~~said~~ manufacturing.

11. (Original) The method of Claim 9 wherein said extracts exhibit an associative relationship with said master process model.

12. (Currently Amended) The method of Claim ~~11~~9 wherein said associative relationship between the extracts and the master process model is a parent/child relationship.

13. (Original) The method of Claim 9 wherein said extracts are used to generate manufacturing process sheets.

14. (Original) The method of Claim 1 wherein said virtual blank is positioned and oriented relative to said coordinate system.

15. (Original) The method of Claim 14 wherein said virtual blank is generated as a three dimensional parametric solid model from a reference set geometry.

16. (Original) The method of Claim 15 wherein said reference set geometry is defined by dimensional characteristics of a modeled part.

17. (Currently Amended) The method of Claim 1 wherein the establishing ~~asaid~~ coordinate system comprises establishing one or more datum planes.

18. (Original) The method of Claim 1 wherein said coordinate system comprises: creating a first datum plane positioned and oriented relative to a reference; creating a second datum plane positioned and oriented relative to said reference; and creating a third datum plane positioned and oriented relative to said reference.

19. (Original) The method of Claim 18 wherein said first datum plane, said second datum plane, and said third datum plane are orthogonal.

20. (Currently Amended) The method of Claim 1 wherein said first and second sets of machining~~manufacturing~~ instructions comprise process sheets.

21. (Original) The method of Claim 20 wherein said process sheets are linked with numerically controlled tools and a coordinate measuring machine.

22. (Original) The method of Claim 1 wherein said master process model is linked with numerically controlled tools and a coordinate measuring machine.

23. (Currently Amended) The method of Claim 1 wherein said ~~another~~ associative relationship between the manufacturing feature for alternate operations and the coordinate system is a parent/child relationship.

24. (Currently Amended) The method of Claim 1 wherein ~~further including~~ said manufacturing feature for alternate operations further exhibits~~ing~~ an associative relationship with- said manufacturing feature.

25. (Currently Amended) The method of Claim 24 wherein said associative relationship between said manufacturing feature for alternate operations and said manufacturing feature is a parent/child relationship.

26. (Original) The method of Claim 1 wherein said virtual blank exhibits an associative relationship with said manufacturing feature for alternate operations.

27. (Currently Amended) The method of Claim 26 wherein said associative relationship between said virtual blank and said manufacturing feature for alternate operations is a parent/child relationship.

28. (Original) The method of Claim 1 further comprising creating alternate extracts from said alternate master process model.

29. (Currently Amended) The method of Claim 28 wherein said alternate extracts comprise replicated models of said alternate master process model at various operations of ~~said~~ manufacturing.

30. (Original) The method of Claim 28 wherein said alternate extracts are used to generate manufacturing alternate process sheets.

31. (Currently Amended) A method of horizontally structured CAD/CAM manufacturing for large parts, comprising:

selecting a blank for machining into an actual part;

establishing a coordinate system;

creating a master process model comprising:

~~a virtual blank corresponding to said blank;~~

~~a manufacturing feature;~~

~~_virtual machining of said a manufacturing feature into a said virtual blank~~
corresponding to said blank,;

~~_said manufacturing feature exhibiting an associative relationship with said coordinate system;~~

generating a first set of machining instructions to create said actual part by machining said manufacturing feature into said blank;

generating a junior master process model in a separate file than that of said master process model, comprising;

—— ~~a 3-D model generated from said master process model;~~

—— ~~a subsequent manufacturing feature;~~

—— ~~_virtual machining of said subsequent manufacturing feature into a said 3-D model~~
generated from said master process model,;

——said subsequent manufacturing feature exhibiting ~~another~~ associative relationship with said coordinate system; and

generating a second set of machining -instructions -to create said actual part by machining said subsequent manufacturing feature into said blank.

32. (Currently Amended) The method of Claim 31 wherein said associative relationship between the manufacturing feature and the coordinate system is a parent/child relationship.

33. (Original) The method of Claim 31 further including another manufacturing feature exhibiting an associative relationship with said manufacturing feature.

34. (Currently Amended) The method of Claim 33 wherein said associative relationship between the other manufacturing feature and the manufacturing feature is a parent/child relationship.

35. (Currently Amended) The method of Claim ~~33~~ wherein said virtual blank exhibits an associative relationship with the ~~another said~~ manufacturing feature.

36. (Currently Amended) The method of Claim 35 wherein said associative relationship between the virtual blank and the other manufacturing feature is a parent/child relationship.

37. (Original) The method of Claim 31 wherein said virtual blank exhibits an associative relationship with said coordinate system.

38. (Currently Amended) The method of Claim 37 wherein said associative relationship between the virtual blank and the coordinate system is a parent/child relationship.

39. (Original) The method of Claim 31 further comprising creating extracts from said master process model.

40. (Currently Amended) The method of Claim 39 wherein said extracts comprise replicated models of said master process model at various operations of ~~said~~ manufacturing.

41. (Original) The method of Claim 39 wherein said extracts exhibit an associative relationship with said master process model.

42. (Currently Amended) The method of Claim ~~41~~³⁹ wherein said associative relationship between the extracts and the master process model is a parent/child relationship.

43. (Original) The method of Claim 39 wherein said extracts are used to generate manufacturing process sheets.

44. (Original) The method of Claim 31 wherein said virtual blank is positioned and oriented relative to said coordinate system.

45. (Original) The method of Claim 44 wherein said virtual blank is generated as a three dimensional parametric solid model from a reference set geometry.

46. (Original) The method of Claim 45 wherein said reference set geometry is defined by dimensional characteristics of a modeled part.

47. (Currently Amended) The method of Claim 31 wherein said establishing ~~a~~said coordinate system comprises establishing one or more datum planes.

48. (Currently Amended) The method of Claim 31 wherein said establishing a coordinate system comprises:

creating a first datum plane positioned and oriented relative to a reference;

creating a second datum plane positioned and oriented relative to said reference; and

creating a third datum plane positioned and oriented relative to said reference.

49. (Original) The method of Claim 48 wherein said first datum plane, said second datum plane, and said third datum plane are orthogonal.

50. (Currently Amended) The method of Claim 31 wherein said first and second sets of machining~~manufacturing~~ instructions comprise process sheets.

51. (Original) The method of Claim 50 wherein said process sheets are linked with numerically controlled tools and a coordinate measuring machine.

52. (Original) The method of Claim 31 wherein said master process model is linked with numerically controlled tools and a coordinate measuring machine.

53. (Original) The method of Claim 31 further including modifying a link among a plurality of modeling elements.

54. (Cancelled)

55. (Cancelled)

56. (Currently Amended) The method of Claim 53 wherein said modifying comprises removing said link among said plurality of modeling elements.

57. (Currently Amended) The method of Claim 53 wherein said modifying comprises establishing said link among said plurality of modeling elements.

58. (Currently Amended) The method of Claim 53 wherein said modifying a links among a plurality of modeling elements includes substituting a second plurality of modeling elements for said plurality of modeling elements.

59. (Currently Amended) The method of Claim 31 wherein said ~~another~~ associative relationship between the subsequent manufacturing feature and the coordinate system is a parent/child relationship.

60. (Currently Amended) The method of Claim 31 ~~wherein further including~~ said subsequent manufacturing feature exhibiting ~~ing~~ an associative relationship with -said manufacturing feature.

61. (Currently Amended) The method of Claim 60 wherein said associative relationship between the subsequent manufacturing feature and the manufacturing feature is a parent/child relationship.

62. (Original) The method of Claim 31 wherein said virtual blank exhibits an associative relationship with said subsequent manufacturing feature.

63. (Currently Amended) The method of Claim 62 wherein said associative relationship between the virtual blank and the subsequent manufacturing feature is a parent/child relationship.

64. (Original) The method of Claim 31 further comprising creating extracts from said junior master process model.

65. (Currently Amended) The method of Claim 64 wherein said extracts comprise replicated models of said junior master process model at various operations of said manufacturing.

66. (Original) The method of Claim 64 wherein said extracts are used to generate manufacturing process sheets.

67. (Currently Amended) The method of Claim 31 wherein said junior master process model is generated following ~~the~~ machining of said master process model.

68. (Currently Amended) A method of horizontally structured CAD/CAM manufacturing for a plurality of charted parts, the method comprising:

- selecting a blank for machining into an actual part;
- establishing a coordinate system;
- creating a master process model comprising:
 - ~~a virtual blank corresponding to said blank;~~
 - ~~a manufacturing feature;~~
 - _____ virtual machining ~~of said manufacturing feature into a said~~ virtual blank corresponding to said blank;
 - said manufacturing feature exhibiting an associative relationship with said coordinate system;
- generating a first set of machining instructions to create said actual part by machining said manufacturing feature into said blank; wherein
 - ~~said master process model including, as said~~ manufacturing features included in said master process model comprise manufacturing features, ~~those said manufacturing features~~ common to said plurality of charted parts;
 - generating a subsequent master process model comprising:
 - ~~another virtual blank~~
 - ~~a copy of said manufacturing features of said master process model;~~
 - ~~a manufacturing feature uncommon to said plurality of charted parts;~~
 - _____ virtual machining ~~of said manufacturing feature that~~ which is uncommon to said plurality of charted parts into said another virtual blank, the other virtual blank including a copy of the manufacturing features of said master process model; wherein
 - ~~said manufacturing feature that~~ which is uncommon to said plurality of charted parts exhibiting another associative relationship with said coordinate system; and
 - generating a second set of machining -instructions -to create said actual part by machining said manufacturing features common and uncommon to said plurality of charted parts into said blank.

69. (Currently Amended) The method of Claim 68 wherein said associative relationship between the manufacturing feature and the coordinate system is a parent/child relationship.

70. (Original) The method of Claim 68 further including another manufacturing feature exhibiting an associative relationship with said manufacturing feature.

71. (Currently Amended) The method of Claim 70 wherein said associative relationship between the other manufacturing feature and the manufacturing feature is a parent/child relationship.

72. (Currently Amended) The method of Claim ~~70~~68 wherein said virtual blank exhibits an associative relationship with the ~~another said~~ manufacturing feature.

73. (Currently Amended) The method of Claim 72 wherein said associative relationship between the virtual blank and the other manufacturing feature is a parent/child relationship.

74. (Original) The method of Claim 68 wherein said virtual blank exhibits an associative relationship with said coordinate system.

75. (Currently Amended) The method of Claim 74 wherein said associative relationship between the virtual blank and the coordinate system is a parent/child relationship.

76. (Original) The method of Claim 68 further comprising creating extracts from said master process model.

77. (Currently Amended) The method of Claim 76 wherein said extracts comprise replicated models of said master process model at various operations of ~~said~~ manufacturing.

78. (Original) The method of Claim 76 wherein said extracts exhibit an associative relationship with said master process model.

79. (Currently Amended) The method of Claim ~~78~~[76] wherein said associative relationship between the extracts and the master process model is a parent/child relationship.

80. (Original) The method of Claim 76 wherein said extracts are used to generate manufacturing process sheets.

81. (Original) The method of Claim 68 wherein said virtual blank is positioned and oriented relative to said coordinate system.

82. (Original) The method of Claim 81 wherein said virtual blank is generated as a three dimensional parametric solid model from a reference set geometry.

83. (Original) The method of Claim 82 wherein said reference set geometry is defined by dimensional characteristics of a modeled part.

84. (Currently Amended) The method of Claim 68 wherein said establishing ~~a~~said coordinate system comprises establishing one or more datum planes.

85. (Currently Amended) The method of Claim 68 wherein said establishing a coordinate system comprises:

creating a first datum plane positioned and oriented relative to a reference;
creating a second datum plane positioned and oriented relative to said reference; and
creating a third datum plane positioned and oriented relative to said reference.

86. (Original) The method of Claim 85 wherein said first datum plane, said second datum plane, and said third datum plane are orthogonal.

87. (Currently Amended) The method of Claim 68 wherein said first and second sets of machining~~manufacturing~~ instructions comprise process sheets.

88. (Original) The method of Claim 87 wherein said process sheets are linked with numerically controlled tools and a coordinate measuring machine.

89. (Original) The method of Claim 68 wherein said master process model is linked with numerically controlled tools and a coordinate measuring machine.

90. (Original) The method of Claim 68 further including modifying a link among a plurality of modeling elements.

91. (Cancelled)

92. (Cancelled)

93. (Currently Amended) The method of Claim 90 wherein said modifying comprises removing said link among said plurality of modeling elements.

94. (Currently Amended) The method of Claim 90 wherein said modifying comprises establishing said link among said plurality of modeling elements.

95. (Currently Amended) The method of Claim 90 wherein said modifying a link[s] among a plurality of modeling elements includes substituting a second plurality of modeling elements for said plurality of modeling elements.

96. (Currently Amended) The method of Claim 68 wherein said ~~another~~ associative relationship between the manufacturing feature that is uncommon to said plurality of charted parts and the coordinate system is a parent/child relationship.

97. (Currently Amended) The method of Claim 68 ~~wherein further including~~ said manufacturing feature uncommon to said plurality of charted parts exhibiting an associative relationship with another ~~of said~~ manufacturing feature.

98. (Currently Amended) The method of Claim 97 wherein said associative relationship between the manufacturing feature uncommon to said plurality of charted parts and the other manufacturing feature is a parent/child relationship.

99. (Currently Amended) The method of Claim 68 wherein said virtual blank exhibits an associative relationship with any other ~~said~~ manufacturing feature ~~that which~~ is uncommon to said plurality of charted parts.

100. (Currently Amended) The method of Claim 99 wherein said associative relationship between the virtual blank and the any other manufacturing feature that is uncommon to said plurality of charted parts is a parent/child relationship.

101. (Currently Amended) The method of Claim 68 ~~wherein further including~~ said manufacturing features common to said plurality of charted parts exhibiting an associative relationship with another ~~of said~~ manufacturing feature.

102. (Currently Amended) The method of Claim 101 wherein said associative relationship between the manufacturing features common to said plurality of charted parts and the other manufacturing feature is a parent/child relationship.

103. (Currently Amended) The method of Claim 68 wherein said virtual blank exhibits an associative relationship with any ~~of the other said~~ manufacturing features ~~which is~~ common to said plurality of charted parts.

104. (Currently Amended) The method of Claim 103 wherein said associative relationship between the virtual blank and any of the manufacturing features common to said plurality of charted parts is a parent/child relationship.

105. (Original) The method of Claim 68 further comprising creating extracts from said subsequent master process model.

106. (Currently Amended) The method of Claim 105 wherein said extracts comprise replicated models of said subsequent master process model at various operations of ~~said~~ manufacturing.

107. (Original) The method of Claim 105 wherein said extracts are used to generate manufacturing process sheets.

108. (Currently Amended) A manufactured part created by a method of horizontally structured CAD/CAM manufacturing with alternate manufacturing operations, comprising:

- a blank for machining into said manufactured part;

- a coordinate system;

- a master process model comprising:

 - a virtual blank corresponding to said blank; and

 - a manufacturing feature ~~wherein said manufacturing feature is~~ characterized by virtual machining ~~of~~ said manufacturing feature into said virtual blank,;

 - said manufacturing feature exhibiting an associative relationship with said coordinate system; wherein

 - said ~~manufactured~~ actual part is created by machining said manufacturing feature into said blank in accordance with a first machining instruction[.];

- an alternate master process model comprising[.];

 - an extracted 3-D model from said master process model; and

 - a manufacturing feature for alternate operations; wherein

 - ~~virtual machining of~~ said manufacturing feature for alternate operations is virtually machined into said extracted 3-D model[.];

 - said manufacturing feature for alternate operations exhibiting ~~another~~ associative relationship with said coordinate system; wherein

 - ~~said~~ generation of said alternate master process model ~~following said~~ virtual machining of said master process model; and wherein further

said ~~manufactured~~^{actual} part is created by machining said manufacturing feature for alternate operations into said blank in accordance with a second machining instruction.

109. (Currently Amended) The manufactured part of Claim 108 wherein said ~~another~~ associative relationship between the manufacturing feature and the coordinate system is a parent/child relationship.

110. (Currently Amended) The manufactured part of Claim 108 ~~wherein~~^{further} ~~including~~ said manufacturing feature for alternate operations exhibiting an associative relationship with ~~the~~ manufacturing feature.

111. (Currently Amended) The manufactured part of Claim 110 wherein said associative relationship between the manufacturing feature for alternate operations and the manufacturing feature is a parent/child relationship.

112. (Original) The manufactured part of Claim 108 wherein said virtual blank exhibits an associative relationship with said manufacturing feature for alternate operations.

113. (Currently Amended) The manufactured part of Claim 112 wherein said associative relationship between the virtual blank and the manufacturing feature for alternate operations is a parent/child relationship.

114. (Original) The manufactured part of Claim 108 further comprising alternate extracts created from said alternate master process model.

115. (Currently Amended) The manufactured part of Claim 114 wherein said alternate extracts comprise replicated models of said alternate master process model at various operations of ~~said~~ manufacturing.

116. (Original) The manufactured part of Claim 115 wherein said alternate extracts are used to generate manufacturing alternate process sheets.

117. (Currently Amended) A manufactured part created by a method of horizontally structured CAD/CAM manufacturing for large parts, comprising:

a blank for machining into said manufactured part~~[:]~~;

a coordinate system;

a master process model comprising:

a virtual blank corresponding to said blank; and

a manufacturing feature ~~wherein said manufacturing feature is~~ characterized by virtual machining ~~of~~ said manufacturing feature into said virtual blank,;

said manufacturing feature exhibiting an associative relationship with said coordinate system; wherein

said ~~manufactured~~ actual part is created by machining said manufacturing feature into said blank in accordance with a first machining instruction;] and

a junior master process model in a separate file than that of said master process model, comprising[;]:

a 3-D model generated from said master process model; and

a subsequent manufacturing feature modeled by virtual machining of said subsequent manufacturing feature into said 3-D model[;],

said subsequent manufacturing feature exhibiting ~~another~~ associative relationship with said coordinate system; ~~and~~ wherein

said ~~manufactured~~ actual part is created by machining said subsequent manufacturing feature into said blank in accordance with a second machining instruction.

118. (Currently Amended) The manufactured part of Claim 117 wherein said ~~another~~ associative relationship between the manufacturing feature and the coordinate system is a parent/child relationship.

119. (Original) The manufactured part of Claim 117 further including a subsequent manufacturing feature exhibiting an associative relationship with -said manufacturing feature.

120. (Currently Amended) The manufactured part of Claim 119 wherein said associative relationship between the subsequent manufacturing feature and the manufacturing feature is a parent/child relationship.

121. (Currently Amended) The manufactured part of Claim 11[7]9 wherein said virtual blank exhibits an associative relationship with said subsequent manufacturing feature.

122. (Currently Amended) The manufactured part of Claim 121 wherein said associative relationship between the virtual blank and the subsequent manufacturing feature is a parent/child relationship.

123. (Currently Amended) The manufactured part of Claim 117 further comprising ~~an~~ extracts created from said junior master process model.

124. (Currently Amended) The manufactured part of Claim 123 wherein said extracts comprise replicated models of said junior master process model at various operations of ~~said~~ manufacturing.

125. (Original) The manufactured part of Claim 123 wherein said extracts are used to generate manufacturing process sheets.

126. (Currently Amended) The manufactured part of Claim 117 wherein said junior master process model is generated following ~~the~~ machining of said master process model.

127. (Currently Amended) A manufactured part created by a method of horizontally structured CAD/CAM manufacturing for a plurality of charted parts, comprising:

- a blank for machining into said manufactured part;
- a coordinate system;
- a master process model comprising:
 - a virtual blank corresponding to said blank; and
 - a manufacturing feature ~~wherein said manufacturing feature is~~ characterized by virtual machining ~~of said manufacturing feature into said virtual blank,;~~ said manufacturing feature exhibiting an associative relationship with said coordinate system; wherein
 - said manufactured~~actual~~ part is created by machining said manufacturing feature into said blank in accordance with a first machining instruction; and wherein further
 - ~~said master process model including, as said manufacturing features included in said master process model comprise manufacturing features, those said manufacturing features common to said plurality of charted parts; and~~
 - a subsequent master process model comprising:[:]
 - another virtual blank including a copy of said manufacturing features of said master process model;
 - a manufacturing feature uncommon to said plurality of charted parts that is modeled by virtual machining ~~of said manufacturing feature that~~which is uncommon to said plurality of charted parts into said another virtual blank; wherein
 - said manufacturing feature ~~that~~which is uncommon to said plurality of charted parts ~~exhibiting another~~ associative relationship with said coordinate system; and wherein further
 - said manufactured~~actual~~ part is created by machining said manufacturing features common and uncommon to said plurality of charted parts into said blank in accordance with a second machining instruction.

128. (Currently Amended) The manufactured part of Claim 127 wherein said ~~another~~ associative relationship between the manufacturing feature and the coordinate system is a parent/child relationship.

129. (Currently Amended) The manufactured part of Claim 127 ~~wherein further including~~ said manufacturing feature uncommon to said plurality of charted parts exhibiting an associative relationship with another ~~of said~~ manufacturing feature.

130. (Currently Amended) The manufactured part of Claim 129 wherein said associative relationship between the manufacturing feature uncommon to said plurality of charted parts and the other manufacturing feature is a parent/child relationship.

131. (Currently Amended) The manufactured part of Claim 127 wherein said virtual blank exhibits an associative relationship with any ~~other said~~ manufacturing features that are ~~which is~~ uncommon to said plurality of charted parts.

132. (Currently Amended) The manufactured part of Claim 131 wherein said associative relationship between the virtual blank and the any virtual blank and any manufacturing features that are uncommon to said plurality of charted parts is a parent/child relationship.

133. (Currently Amended) The manufactured part of Claim 127 ~~wherein further including~~ said manufacturing features common to said plurality of charted parts exhibiting an associative relationship with another ~~of said~~ manufacturing feature.

134. (Currently Amended) The manufactured part of Claim 133 wherein said associative relationship between the manufacturing features common to said plurality of charted parts and the other manufacturing feature is a parent/child relationship.

135. (Currently Amended) The manufactured part of Claim 127 wherein said virtual blank exhibits an associative relationship with any of the ~~other said~~ manufacturing features ~~which is~~ common to said plurality of charted parts.

136. (Currently Amended) The manufactured part of Claim 135 wherein said associative relationship between the virtual blank and any of the manufacturing features common to said plurality of charted parts is a parent/child relationship.

137. (Original) The manufactured part of Claim 127 further comprising extracts created from said subsequent master process model.

138. (Currently Amended) The manufactured part of Claim 137 wherein said extracts comprise replicated models of said subsequent master process model at various operations of ~~said~~ manufacturing.

139. (Original) The manufactured part of Claim 137 wherein said extracts are used to generate manufacturing process sheets.

140. (Currently Amended) A storage medium encoded with a machine-readable computer program code for horizontally structured CAD/CAM manufacturing for alternate operations, said storage medium including instructions for causing a computer to implement a method comprising:

selecting a blank for machining into an actual part;

establishing a coordinate system;

creating a master process model comprising:

~~a virtual blank corresponding to said blank;~~

~~a manufacturing feature;~~

~~virtual machining of said a manufacturing feature into a said virtual blank corresponding to the blank,;~~

said manufacturing feature exhibiting an associative relationship with said coordinate system;

generating machining instructions to create said actual part by machining said manufacturing feature into said blank;

generating an alternate master process model comprising:

~~an extracted 3-D model from said master process model;~~

~~a manufacturing feature for alternate operations;~~

~~virtual machining of said a manufacturing feature for alternate operations into a said extracted 3-D model, the extracted 3-D model extracted from the master process model; wherein~~

~~said manufacturing feature for alternate operations exhibiting another associative relationship with said coordinate system; and wherein further~~

~~said generating said alternate master process model following said virtual machining of said master process model; and~~

generating a second set of machining instructions to create said actual part by machining said manufacturing feature for alternate operations into said blank.

141. (Currently Amended) A storage medium encoded with a machine-readable computer program code for horizontally structured CAD/CAM manufacturing for large parts, said storage medium including instructions for causing a computer to implement a method comprising:

- selecting a blank for machining into an actual part;
- establishing a coordinate system;
- creating a master process model comprising:
 - ~~a virtual blank corresponding to said blank;~~
 - ~~a manufacturing feature;~~
 - virtual machining of said manufacturing feature into said virtual blank corresponding to the blank;

- said manufacturing feature exhibiting an associative relationship with said coordinate system;

- generating a first set of machining instructions to create said actual part by machining said manufacturing feature into said blank;

- generating a junior master process model in a separate file than that of said master process model, comprising:

- ~~—— a 3-D model generated from said master process model;~~
 - ~~—— a subsequent manufacturing feature;~~
 - ~~—— virtual machining of said a subsequent manufacturing feature into said 3-D model generated from said master process model[;].~~

- ~~—— said subsequent manufacturing feature exhibiting another associative relationship with said coordinate system; and~~

- generating a second set of machining instructions -to create said actual part by machining said subsequent manufacturing feature into said blank.

142. (Currently Amended) A storage medium encoded with a machine-readable computer program code for horizontally structured CAD/CAM manufacturing for a plurality of charted parts, said storage medium including instructions for causing a computer to implement a method comprising:

- selecting a blank for machining into an actual part;

establishing a coordinate system;
 creating a master process model comprising:
~~a virtual blank corresponding to said blank;~~
~~a manufacturing feature;~~
~~virtual machining of said manufacturing feature into said virtual blank~~
corresponding to the blank;
 said manufacturing feature exhibiting an associative relationship with said coordinate system;
 generating a first set of machining instructions to create said actual part by machining said manufacturing feature into said blank; wherein
~~said master process model including, as said manufacturing features included in the master process model comprise manufacturing features, those said manufacturing features common to said plurality of charted parts;~~
 generating a subsequent master process model comprising[:]
~~another virtual blank with a copy of said manufacturing features of said master process model;~~
~~—— a manufacturing feature uncommon to said plurality of charted parts;~~
~~—— virtual machining of said manufacturing feature~~
~~that which is uncommon to said plurality of charted parts into said another virtual blank, the~~
other virtual blank including a copy of said manufacturing features of said master process model; wherein
 said manufacturing feature ~~that which~~ is uncommon to said plurality of charted parts exhibiting ~~ing another~~ associative relationship with said coordinate system; and
 generating a second set of machining instructions to create said actual part by machining said manufacturing features common and uncommon to said plurality of charted parts into said blank.

143. (Currently Amended) A computer data signal for horizontally structured CAD/CAM manufacturing for alternate operations, said computer data signal comprising code configured to cause a processor to implement a method comprising:

selecting a blank for machining into an actual part;

establishing a coordinate system;
creating a master process model comprising:
~~a virtual blank corresponding to said blank;~~
~~a manufacturing feature;~~
~~_virtual machining of said manufacturing feature into a said virtual blank~~
corresponding to said blank;
said manufacturing feature exhibiting an associative relationship with said
coordinate system;
generating a first set of machining instructions to create said actual part by
machining said manufacturing feature into said blank;
generating an alternate master process model comprising:
~~—— an extracted 3-D model from said master process model;~~
~~—— a manufacturing feature for alternate operations;~~
~~—— _virtual machining of said manufacturing feature for alternate~~
operations into ~~an said~~ extracted 3-D model, the extracted 3-D model extracted from the
master process model; wherein
~~—— said manufacturing feature for alternate operations exhibitsing another~~
associative relationship with said coordinate system; and wherein further
said generating said alternate master process model following said
virtual machining of said master process model; and
generating a second set of machining instructions to create said actual part by
machining said manufacturing feature for alternate operations into said blank.

144. (Currently Amended) A computer data signal for horizontally structured CAD/CAM manufacturing for large parts, said computer data signal comprising code configured to cause a processor to implement a method comprising:

- selecting a blank for machining into an actual part;
- establishing a coordinate system;
- creating a master process model comprising:
 - ~~a virtual blank corresponding to said blank;~~
 - ~~a manufacturing feature;~~
 - virtual machining of said manufacturing feature into said virtual blank corresponding to the blank;

- said manufacturing feature exhibiting an associative relationship with said coordinate system;

- generating a first set of machining instructions to create said actual part by machining said manufacturing feature into said blank;

- generating a junior master process model in a separate file than that of said master process model, comprising;

- ~~—— a 3-D model generated from said master process model;~~
 - ~~—— a subsequent manufacturing feature;~~
 - ~~—— virtual machining of said subsequent manufacturing feature into said 3-D model generated from the master process model[;];~~

- ~~—— said subsequent manufacturing feature exhibiting another associative relationship with said coordinate system; and~~

- generating a second set of machining instructions -to create said actual part by machining said subsequent manufacturing feature into said blank.

145. (Currently Amended) A computer data signal for horizontally structured CAD/CAM manufacturing for a plurality of charted parts, said computer data signal comprising code configured to cause a processor to implement a method comprising:

- selecting a blank for machining into an actual part;
- establishing a coordinate system;
- creating a master process model comprising:

~~a virtual blank corresponding to said blank;~~
~~a manufacturing feature;~~
~~_virtual machining of said manufacturing feature into said virtual blank~~
corresponding to the blank;
said manufacturing feature exhibiting an associative relationship with said coordinate system;
generating a first set of machining instructions to create said actual part by machining said manufacturing feature into said blank; wherein
~~said master process model including, as said manufacturing features included~~
in the master process model comprise manufacturing features; ~~those said manufacturing~~
features common to said plurality of charted parts;
generating a subsequent master process model comprising;
~~—— another virtual blank with a copy of said manufacturing features of~~
~~said master process model;~~
~~—— a manufacturing feature uncommon to said plurality of charted parts;~~
~~—— _virtual machining of said manufacturing feature which~~
~~is uncommon to said plurality of charted parts into said another virtual blank; wherein~~
said manufacturing feature ~~that~~which is uncommon to said plurality of charted parts exhibiting ~~ing another~~ associative relationship with said coordinate system; and
generating a second set of machining instructions- to create said actual part by machining said manufacturing features common and uncommon to said plurality of charted parts into said blank.